

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
27 June 2002 (27.06.2002)

PCT

(10) International Publication Number
WO 02/49785 A1

(51) International Patent Classification⁷: **B21D 39/00**,
B23P 11/00, 17/00, 19/02, C23C 14/00

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(21) International Application Number: PCT/US01/49126

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(22) International Filing Date:
17 December 2001 (17.12.2001)

(81) Designated States (*national*): JP, KR, US.

(25) Filing Language: English

(84) Designated States (*regional*): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).

(26) Publication Language: English

(30) Priority Data:
60/255,873 18 December 2000 (18.12.2000) US

Published:
— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

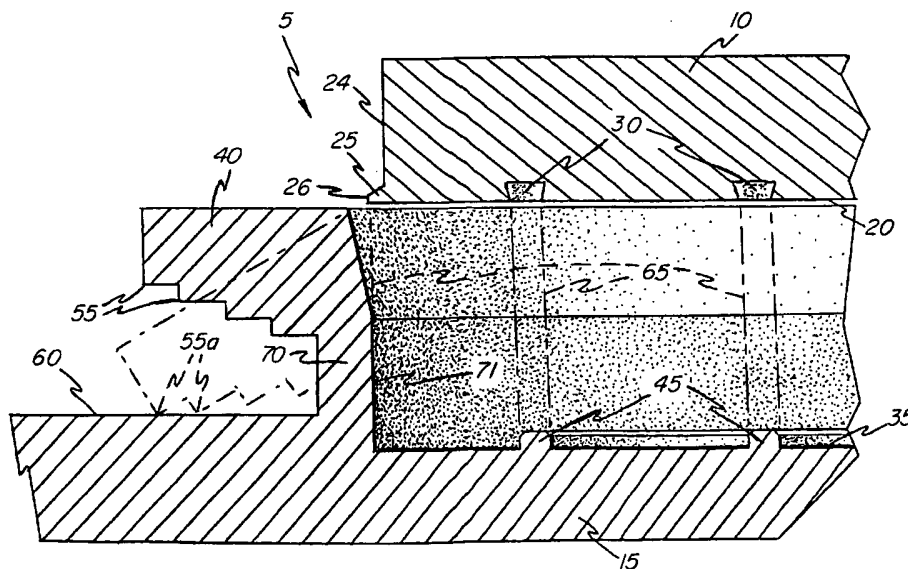
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **LOW TEMPERATURE SPUTTER TARGET/BACKING PLATE JOINING TECHNIQUE AND ASSEMBLIES MADE THEREBY**



(57) Abstract: The present invention pertains to low temperature sputter target/backing plate (10, 15) joining techniques and assemblies made thereby. More specifically, the joining techniques incorporate a mechanical bond between the corresponding target material (10) and backing plate material (15) around the periphery thereof. The resulting target assemblies are free of welding and other high temperature joining.

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CLAIMS

1. A method of manufacturing a sputter target assembly including a target material with mating surface and a backing plate material with mating surface, comprising:
 - a) forming a lip in one of said materials and a clamp in the other
- 5 of said materials; and
 - b) low temperature pressure consolidating said materials such that said lip and said clamp form a mechanical bond.
2. Method as recited in claim 1 further comprising step:
 - c) machining said target assembly to remove excess material.
3. Method as recited in claim 1 wherein said target comprises Al, Cu, Ti, Co or their alloys.
4. Method as recited in claim 1 wherein said backing plate comprises Al, stainless steel, Cu, Ti or their alloys.
5. Method as recited in claim 1 wherein said target comprises Ti.
6. Method as recited in claim 1 wherein said step b) comprises pressure consolidating said assembly at about room temperature.
7. Method as recited in claim 1 wherein said low temperature is a temperature of less than 50% of the melting temperature of the lower melting member of the target and backing plate.
8. Method as recited in claim 1 wherein said low temperature is less than about 100°C.
9. Method as recited in claim 1 wherein said low temperature is less than about 38°C.

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10. Method as recited in claim 1 wherein said low temperature is about room temperature.
11. A method of manufacturing a sputter target assembly including a target material with mating surface and a backing plate material with mating surface, comprising:
- a) forming a lip in one of said materials and a clamp in the other
 - 5 of said materials;
 - b) forming protruding portions extending from one of said surfaces; and
 - c) low temperature pressure consolidating said materials such that said lip and said clamp form a mechanical bond and said protruding portions
 - 10 form a mechanical interlock.
12. Method as in claim 12 further comprising step:
- d) machining said target assembly to remove excess material.
13. Method as in claim 12 wherein step b) further comprises forming grooves in the other of said surfaces corresponding with said protruding portions.
14. A target assembly made by any one of the preceding claims.
15. A target assembly comprising:
- a target material joined to a backing plate material with a mechanical bond extending around a periphery thereof.
16. A target assembly as in claim 15 further comprising a mechanical interlock joining said target material to said backing plate material.
17. A target assembly as in claim 15 wherein said target material is Ti.

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18. A target assembly as in claim 15 wherein said backing plate material is Al.

19. A target assembly as in claim 17 wherein said backing plate material is Al.

